

REMARKS/ARGUMENTS

New claims 3-12 have been added. Thus, claims 1-12 are pending. No new matter was added. Applicants respectfully submit that the present application is in condition for allowance.

I. Priority under 35 USC § 119

On the “Office Action Summary” page of the Office Action, the Examiner states that none of the “copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).”

Enclosed with this Amendment is a copy of the “Notification Concerning Submission or Transmittal of Priority Document” (Form PCT/IB/304) that was issued on June 7, 2001 by the International Bureau of WIPO with respect to the International Stage of the present application. This provides evidence that the Applicants properly and timely provided the certified copy to the International Bureau.

In addition, Applicants state that no changes were made to priority application No. JP 2000-103505 when it was filed as International application No. PCT/JP01/02706. To this end, an executed Verification of Translation of Priority Document and a copy of the translation (which is identical to the translation of the published PCT application) are enclosed.

Applicants submit that the claim of priority is proper and that the Applicants have complied with all requirements.

II. New and Amended Claims

Independent claim 1 is directed to a copper foil and has been amended to require the particle layer to be formed of particles that are about 0.01 to 3 μ m in size. No new matter was added. To this end, we enclose the cover page of PCT application publication No. WO 01/77420 for PCT application No. PCT/JP/02706 that includes an English language abstract that states:

“Copper foil hole-drilled by using laser, wherein at least the laser entry surface of the copper foil is plated with at least one kind of metal including copper to form on the surface a layer of **particles 0.01-3 μ m in size**.”

New claims 3 and 5 each depend from claim 2 and each requires the over-plated coating to be made of specifically identified materials. Claim 3 requires the over-plated coating to be made of Ni, Co, Sn, Zn, In and/or alloys thereof, while claim 5 requires the over-plated coating to be made of Ni, Co, Sn, In and/or alloys thereof. New claims 4 and 6 depend from claims 3 and 1, respectively, and require the particle layer to include at least one of Ni, Co, Sn, Zn, In and alloys thereof. No new matter was added. For example, see page 5, lines 19-21, and page 7, lines 19-21, of the present application as filed.

New claim 7 is directed to a method of drilling a hole in a copper foil. It includes all the same limitations as that stated by independent claim 1. In the Office Action, the Examiner does not give any patentable weight to the “intended use” limitation stated in claim 1. Thus, Applicants present new method claim 7, which contains all the same limitations as claim 1, so that the Examiner will give patentable significance to the present invention which relates to providing copper foils in a condition that enables holes to be properly formed therein by laser beams. This method is not taught, disclosed or suggested by any of the cited references that properly qualify as prior art relative to the present application.

New claims 8-12 include limitations previously discussed with respect to claims 2-6. Thus, no new matter was added.

III. §102(a) and (e) Claim Rejections

In the Office Action, the Examiner rejects claims 1 and 2 under 35 USC §102(a) as being anticipated by European Patent Application No. EP 0966318 A2 of Kataoka et al. and under 35 USC §102(e) as being anticipated by U.S. Patent No. 6,541,126 issued to Yoshioka et al..

The EP '318 application was published on April 26, 2000.

The Yoshioka patent is prior art as of its §371 date of April 23, 2001, and its corresponding PCT application is prior art as its publication date of March 1, 2001. The Yoshioka patent is not prior art as of its corresponding international filing date because its international filing date was not on or after November 29, 2000 and because it was not published in the English language. See 35 USC §102(e) as amended by the American Inventors Protection Act of 1999, and further amended by the Intellectual Property and High Technology Technical Amendments Act of 2002.

The present application is the national stage of an International PCT application. It is afforded a filing date according to the international filing date of the International PCT application. Thus, its filing date is March 30, 2001. It is also afforded a benefit of priority under §119 according to the filing date of its priority document, JP 2000-103505, which was filed on April 5, 2000.

The April 5, 2000 priority date of the present application is prior to the prior art dates (April 26, 2000 and March 1, 2001) of both the above cited references. Thus, neither of the cited references qualifies as prior art relative to the present application.

Reconsideration and removal of the rejections under §102(a) and (e) is respectfully requested for the above stated reasons.

IV. §102(b) Claim Rejections

In the Office Action, the Examiner rejects claims 1 and 2 under 35 USC §102(b) as being anticipated by each of U.S. Patent No. 5,482,784 issued to Ohara et al., U.S. Patent No. 5,679,230 issued to Fatcheric et al., U.S. Patent No. 5,908,544 issued to Lee et al., U.S. Patent No. 5,858,517 issued to Tagusari et al., and EP 0785295 A1 of Tagusari et al..

None of the above cited references discloses, suggests or teaches drilling a hole with a laser beam in a copper foil having a particle layer. In the Office Action, the Examiner admits that the cited references do not disclose laser beam drilling of copper foils.

Method claim 7 of the present application positively requires the step of “drilling a microhole through said copper foil with a laser beam, said laser beam entering said copper foil through said particle layer.” Thus, for this reason, Applicants respectfully submit that method claims 7-12 are not anticipated by the Ohara, Fatcheric, Lee or Tagusari references.

Allowance of claims 7-12 is respectfully requested.

In addition, the Ohara, Lee and Tagusari references only disclose the use of particle layers made of copper and of over-coatings made of zinc. These patents do not disclose copper-alloy particle layers, nor do they disclose over-coatings of Ni, Co, Sn, In and alloys thereof.

Claims 4 and 6 of the present application require the particle layers to include copper as well as at least one of Ni, Co, Sn, Zn, In and alloys thereof. Claim 5 of the present application requires the over-plated coating to be made of Ni, Co, Sn, In and alloys thereof.

Thus, for this reason, Applicants respectfully submit that claims 4-6 are not anticipated by the Ohara, Lee or Tagusari references.

The Fatcheric patent relates to improving adhesion of a copper foil to a substrate without an increase in the measured surface roughness Rz. The patent discloses an electrolytically deposited copper foil having on its matte side a fine nodular metal deposit. In contrast, the present invention provides improvements with respect to the machinability of copper foils, more specifically, the ability to readily drill microholes in copper foils with laser beams. Thus, the present invention is based on a novel finding that laser beam hole drilling of a copper foil can be greatly improved by the use of the claimed particle layer, or claimed particle layer with an over-plated coating. Thus, Applicants submit that all the claims are patentable over the Fatcheric and other cited patents since none fairly disclose the technologically novel and inventive step of the present invention as recited in the amended claims.

Reconsideration and removal of the §102(b) anticipation rejections of the claims is respectfully requested.

In view of the above amendments and remarks, Applicants respectfully submit that the rejections have been overcome and that the present application is in condition for allowance. Thus, a favorable action on the merits is therefore requested.

Please charge any deficiency or credit any overpayment for entering this Amendment
to our deposit account no. 08-3040.

Respectfully submitted,
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